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BDEW-Feedback

On ACER's note "Transporting Pure Hydrogen by Repurposing Existing Gas Infrastructure: Overview of existing studies and reflections on the conditions for repurposing." 16 July 2021.

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BDEW supports the goal of EU climate neutrality by 2050 and the Commission's proposal for a net GHG reduction target for 2030 of at least 55 % compared to 1990. The EU climate targets can only be achieved if **all available decarbonization options are used in all sectors**. Amongst them hydrogen will play a key role, already with regard to the 2030 targets as described in the EU Hydrogen Strategy. A harmonized legal framework for the European hydrogen market must be established without delay – otherwise the market uptake and the related development of hydrogen infrastructure at the necessary scale is likely to be jeopardized.

It is against this backdrop that **the BDEW highly welcomes that ACER dedicates a comprehensive review** of existing studies on conditions for repurposing existing natural gas (NG) pipelines for the transport of climate-neutral hydrogen. The transformation of the NG networks must be taken into account when repurposing. The NG market should remain liquid as long as possible without hindering the development towards a liquid hydrogen market also with a view to the security of supply (cf. conditions mentioned in section 4.1. of the ACER paper). The BDEW would like to provide a **first and non-exhaustive feedback regarding the reflections on repurposing existing pipelines and the development of the hydrogen market** in general which are both subject of this feedback.

On a general note, it should be mentioned that the ACER paper presents an "overview of existing studies", as indicated in its title. It is stated that the review of studies is conducted on a "best effort basis". The BDEW would like to point out **shortcomings of this review** – both related to the selection of studies as well as regarding the presentation of findings from primary sources.

- In chapter 3.1 ACER explains that 24 studies were reviewed out of which five were considered as the most relevant ones. BDEW does not deny that the relevance of these five studies. However, some of the **remaining studies are not less important**. For example, Trinomics and LBST delivered very meaningful contributions for the European Commission.[1] Besides, other relevant articles from the academic sphere as well as

[1] Trinomics and LBST (2020): Sector Integration – Regulatory framework for hydrogen;
Trinomics, LBST et al. (2019): Impact of the use of the biomethane and hydrogen potential on trans-European infrastructure.

from the industry are not comprised in the paper at all, e.g., the work of the Prime Movers' Group on Gas Quality and Hydrogen Handling should be taken into account.[2]

Furthermore, the paper reduces the full range of the debate on the future use of hydrogen:

- The paper leaves out the **gas distribution systems**. Taking into consideration the high importance of the gas distribution grids for supplying industrial, commercial and household customers, this approach is difficult to understand. In the present version of the paper, the only reference to the DSO level relates to the Dutch DSO networks and the costs associated with a switch to hydrogen. For the sake of completeness, it should be mentioned that the actual study referred to in the review, estimates a *maximum* of 700 million euros for the grid adaption and states that the number only remains preliminary. Also, the aforementioned study estimates an increase of grid tariffs of around 10-50%, which is an imprecisely wide range of eventual costs. The increase of grid tariffs is only poorly explained, as such an increase of grid tariffs can hardly be attributed to the exchange of metering stations only[3]. Moreover, It is argued that the note focuses on the review of existing studies on the level of long-distance transportation. However, this approach falls short of a comprehensive overview of current works on the future of hydrogen transportation and distribution. **For bringing substantial benefit to the debate on the future use of hydrogen, the paper has to take on board the distribution level**, as for instance German gas DSOs do also operate steel pipelines with up to 70 bars. If for the time being there are less publications focusing on the decarbonization of distribution-connected customers in these sectors, this is no reason for ACER to keep this part of the gas infrastructure and its potential to use hydrogen out of its considerations.
- As an example, the **German gas DSOs connect all types of customers to the gas grid**, including private households (*especially* heat/buildings) and the majority of industrial and commercial customers for both energetic and feedstock use. Therefore, the costs for repurposing existing NG pipelines should be put into perspective with the **potential benefits coming along with a large number of hydrogen network users** (for instance lower investment risks for network operators, positive impact on tariffs). Also, the so-

[2] See https://www.entsog.eu/prime-movers-group-gas-quality-and-hydrogen-handling

[3] See netbeheer nederland (2018): Toekomstbestendige gasdistributienetten, accessible via: https://www.netbeheernederland.nl/_upload/RadFiles/New/Documents/Kiwa%20-Toekomstbestendige%20gasdistributienetten%20-%20GT170272%20-%202018-07-05%20-D.._.pdf.

called “tipping points” for the cost-efficient transportation and distribution of hydrogen is individual per grid area. Therefore, the figures referred to in the review should be handled with caution. Moreover, BDEW is convinced that there will be decentralized H2 production, which requires connection to the Gas DSO grids.

- The paper neglects the transportation and distribution of blends of hydrogen and methane. Although the paper suggests that the switch to a pure hydrogen network can be done incrementally, blending is not taken into consideration. This is astonishing since, from BDEW’s point of view, **blending of hydrogen into the gas grid can contribute positively to the gradual transformation** of the gas grids and, thereby, realize quick decarbonization gains especially in the short run up to 2030/2040. To facilitate blending, an EU-wide harmonized, initially low technical limit up to which the feed-in and transport of hydrogen is permitted, should be defined in acknowledgement of the technical advancements on the consumer side. Moreover, an incremental path to timely increase the technical limit shall be defined to allow network operators efficient and long-term network planning. Therefore, the aspect of blending definitely has to be included into the present paper.
- The review describes conversion losses throughout the process of producing hydrogen by using electricity, **storing hydrogen** and converting it back to electricity later on. However, this observation leaves aside the fact that a high share of hydrogen is likely to go into the direct use such as in the industry and potentially also in the heating sector. The BDEW is convinced that hydrogen storages can **be beneficial for the overall energy supply system** and, for instance, contribute to a better coping of the intermittency of volatile renewable energy sources.
- ACER suggests that a hydrogen network could be built up cumulatively and in parallel to existing NG lines. As for the transmission level this might certainly be a cost-efficient and feasible approach. However, due to the **non-availability of parallel lines on lower pressure level at least at a big scale** and the impossibility of building parallel structures especially in densely populated urban areas, the coexistence of a pure hydrogen network and a natural gas network is often not a feasible option at the distribution level. Instead, BDEW considers the injection of hydrogen into existing gas grids, with rising shares of hydrogen, as the more relevant way to switch to the use of hydrogen in distribution-connected applications.
- The paper argues that the development of hydrogen networks should be triggered by market interest. **The development of a hydrogen network should not be a goal in itself and should serve market demand and the overall goal of decarbonizing the economy**. Nonetheless it is widely acknowledged that hydrogen and other climate-neutral gases will be needed to achieve the EU climate targets, therefore questioning the need

for hydrogen infrastructure risks that consumers will not be able to decarbonize their energy consumption when required. The hydrogen production and demand survey for producers and consumers of hydrogen and green gases from earlier this year, underlines a growing demand for these types of gas (476 TWh in 2050)[4]. The survey shows **that hydrogen will also be demanded by the DSO level and its current network users**. Therefore, the framework conditions for repurposing should also be considered for the DSO level. To further substantiate this, BDEW is currently gathering further information and analysis on the demand development of hydrogen and decarbonized gas until 2045.

For BDEW, it is important that the aspects mentioned above are taken into account at the next stages of reviewing studies and issuing recommendations on hydrogen networks.

Moreover, BDEW's feedback is meant to serve as input regarding the envisaged the **EU Hydrogen and Gas Market Decarbonization Package.** This legislative package will also offer the opportunity to address, on the European level, the necessary requirements to integrate hydrogen networks into the existing gas infrastructure. Setting a sound European framework will help to overcome the shortcomings of national preliminary regulatory frameworks such as the German model, which lacks a systematic approach to integrate hydrogen networks while transforming the existing gas grids.

[4] See Market survey of the Association of Transmission System Operators for Gas e.V. (FNB Gas), accessible via: https://www.fnb-gas.de/media/2021_07_01_consultation_workshop_sf_2022_hydrogen_and_green_gas_market_surveys.pdf